

JUN 29 1993

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems

PR Docket No. 93-61
RM-8013

COMMENTS OF SOUTHWESTERN BELL MOBILE SYSTEMS, INC.

Respectfully submitted,

**SOUTHWESTERN BELL MOBILE
SYSTEMS, INC.**

Wayne Watts
V.P.-General Attorney
17330 Preston Road, Suite 100A
Dallas, Texas 75252

**GURMAN, KURTIS, BLASK &
FREEDMAN**

**Louis Gurman
Robert L. Hoggarth
1400 Sixteenth Street, N.W.
Washington, D.C. 20036**

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SUMMARY

Southwestern Bell Mobile Systems, Inc. ("SBMS") respectfully comments on the Commission's Notice of Proposed Rulemaking (released April 9, 1993 in PR Docket No. 93-61) to establish permanent rules for the operation of Automatic Vehicle Monitoring ("AVM") systems and to create a new Location and Monitoring Service ("LMS").¹

SBMS supports the establishment of permanent rules for the operation of LMS systems that will expand licensee eligibility and permissible uses of the service, while creating a fair and efficient channelization plan.

Permanent LMS rules should encourage competition and innovation while reducing or eliminating potential electrical interference between carriers. In order to accomplish these

03-12-93 SBMS supports the Commission's proposal to relocate carriers

goals, one with forward links outside the exclusive 4 MHz assignment, the other with the links within it.

SBMS recommends that the same MSA and RSA market boundaries employed by the cellular service be employed for LMS licensing purposes and that twelve month construction periods also be implemented.

SBMS strongly disagrees with any proposal to protect existing LMS licensees by imposing set asides or waiting periods of any length before more than two wide band LMS carriers are licensed in any market. It seems that existing licensees have developed systems for exclusive allocations in an erroneous interpretation of the Commission's original interim LMS policies. As a result, those licensees now apparently find it burdensome to operate in a shared environment. SBMS believes that exclusive 8 MHz allocations will result in fallow spectrum, because in the absence of competition, or at least the prospect of multiple carrier entry, there is a substantial question as to when LMS service might be implemented in many markets across the nation. At least one wide band provider with licenses in more than 100 markets has given the Commission ample cause to doubt its commitment and financial and technical ability to construct any, let alone all, of its markets.

SBMS also supports rules to standardize the technical requirements for LMS operations. SBMS recommends the type acceptance (within eighteen months of a final order in this docket) of all LMS equipment used by systems which are authorized

by that date. SBMS proposes a standard profile for out-of-band emissions that requires the first side lobe to be at least 20 dB below the main lobe of the transmitted signal with each following side lobe reduced by 10 dB

SBMS commends the Commission for its NPRM and urges it to take action at the earliest possible date to make LMS services available to the public through an orderly and non-interfering licensing structure.

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COMMENTS OF SOUTHWESTERN BELL MOBILE SYSTEMS, INC.

Southwestern Bell Mobile Systems, Inc. ("SBMS") submits these comments in response to the Commission's Notice of Proposed Rulemaking, 8 FCC Rcd 2502 (1993) (hereinafter "NPRM") in the above captioned proceeding.¹

I. INTRODUCTION

In its NPRM, the Commission seeks comments on its proposals to establish permanent rules for the operation of Automatic Vehicle Monitoring ("AVM") systems and to create a new Location and Monitoring Service ("LMS").² SBMS supports the establishment of permanent rules for the operation of LMS systems that will expand licensee eligibility and permissible uses of the service, while creating a fair and efficient channelization plan.

¹ SBMS is a wholly-owned subsidiary of Southwestern Bell Corporation ("SBC"), a publicly traded corporation. Through its various ownership interests, SBMS is one of the largest providers of cellular telephone service in the United States and has been a leader in the development and implementation of advanced telecommunications technologies. SBC, on behalf of SBMS, has been

It is critically important that the rules ultimately adopted in this docket encourage competition and innovation while reducing or eliminating potential electrical interference between carriers. In order to accomplish these goals, SBMS proposes two alternative allocation plans in place of the allocation plan proposed in the NPRM. Either plan, if adopted, would (1) support the Commission's determination to relocate narrow band LMS systems to discrete spectrum so that such systems will not interfere with wide band systems; (2) support the licensing of multiple wide band LMS providers on an exclusive basis; and (3) assign spectrum for 250 KHz forward link frequencies associated with wide band operation on a non-interfering basis. Because SBMS believes that LMS will be a natural adjunct to cellular service, it recommends that the same market boundaries be employed for licensing purposes and that twelve month construction periods also be employed.

While SBMS generally supports the Commission's proposals in this docket, it strongly disagrees with any proposal to protect existing LMS licensees by imposing set asides or waiting periods of any length before more than two wide band LMS carriers are licensed in any market.³ As demonstrated herein, if any set asides or waiting periods were established today, there is a strong likelihood that scores of markets nationwide would be served by only one or perhaps no wide band LMS operator. At the very least, there is a substantial question as to when LMS service might be

³ NPRM at para. 22.

implemented in many markets absent the prospect of multiple carrier entry creating a spur of competition.

Finally, SBMS supports new rules to standardize the technical requirements for LMS operations. In particular, SBMS recommends the type acceptance within eighteen months of a final order in this docket of all LMS equipment used by systems which are authorized by that date, and it supports standard out-of-band emission requirements.

II. THE COMMISSION SHOULD MAXIMIZE THE UTILIZATION OF THE LMS SPECTRUM BY EXPANDING LICENSEE ELIGIBILITY AND INCREASING PERMISSIBLE USES OF LMS CHANNELS.

SBMS supports the Commission's goal to establish a competitive and dependable environment in which LMS systems can continue to develop.⁴ SBMS believes that this goal can be achieved in large part by expanding the number of potential service providers and the types of location and monitoring services they offer.

A. SBMS Supports the Commission's Proposal to Expand the Permissible Uses of LMS Spectrum.

The Commission has aggressively sought to expand permissible services which can be offered by LMS licensees to include service to individuals and the Federal Government.⁵ SBMS fully supports the Commission's goal of expanding the permissible services and the

⁴ NPRM at para. 5.

⁵ NPRM at para. 7.

range of potential customers. In addition, SBMS supports the provision of these services on a private carrier basis.⁶

B. The Commission Can Promote the Maximum Use and Development of the Spectrum By Expanding Its Definition of LMS.

No one did or could have predicted the explosive growth of wireless services over the last ten years. In its own cellular business SBMS has witnessed the rapid and highly successful development and implementation of cellular service throughout the nation.⁷ SBMS perceives the demand for LMS services to be extraordinarily high not only as a stand alone service, but as an adjunct to cellular services.⁸ In response to this demand SBMS has applied for authority to provide LMS in Chicago, Illinois.⁹ As it

⁶ SBMS recognizes that legislation is currently pending which would eliminate the distinction between private and common carrier "commercial mobile service" providers. S.332, 103 Cong., 1st Sess. §9 (1993). SBMS supports this legislation and believes that all carriers providing similar services should be regulated the same, operated under the same rules and regulations and have the same opportunities to utilize the spectrum.

⁷ Cellular service is provided by at least one carrier in every market area licensed by the Commission and in the overwhelming majority of these markets, two carriers operate today. The cellular industry now has in excess of ten million customers receiving service throughout the nation. Growth in the employment by the cellular industry alone has increased from less than 1,500 employees in 1985 to nearly 35,000 at the end of 1992.

⁸ Cellular carriers are ideally suited as LMS operators because they can achieve efficiencies and economies through the use of their existing cellular infrastructure.

⁹ See SBMS Application for Automatic Vehicle Monitoring System, FCC File Nos. 346790, 346791, filed December 23, 1992. SBMS' application seeks the ability to locate and monitor animate and inanimate objects as a service to individual customers. In the NPRM, the Commission acknowledges the demand for fleet management services and the ability to monitor and locate animate and inanimate objects. See NPRM at 100-101.

has done in the case of cellular and other wireless services, the Commission should give LMS providers the broadest possible latitude to provide services which the public wants and technology allows.¹⁰

In this regard, the language of the NPRM and the proposed rules unduly limit the service applications which could be implemented over LMS spectrum. In particular, the definition of LMS proposed by the NPRM appears to limit LMS operations to the location of and communication with certain monitored radio units. SBMS perceives a strong demand for the utilization of LMS technology not only to locate, monitor and communicate with equipment and devices which are being located, but also to communicate with units and devices whose locations remain fixed.

Some of the services which SBMS believes could be offered on the LMS spectrum extend far beyond the tracking and location of individuals and animate and inanimate objects. High capacity LMS systems studied by SBMS can support low cost messaging and can be

office air conditioning unit, if there is an air conditioning failure, the LMS device could signal the problem to a monitoring station, which could in turn dispatch a repair team to the scene. Obviously, the air conditioning unit's location would be known, so the location information itself would not be needed. A similar application could be applied to a vending machine that would notify its owner that it should be restocked with a particular item. LMS units and sensors could be placed around gas pipelines or gasoline filling terminals to signal leaks, and home or business security alarms could be adapted to signal a break-in or provide for panic button activation. These services would be offered in addition to fleet management services, stolen vehicle location services, emergency roadside assistance services and the usual services which are typically associated with location and monitoring activities.

In order to utilize the licensed spectrum to its fullest potential, SBMS suggests that the following revisions be made to the proposed rules set out in the Appendix of the NPRM:

1. Proposed Section 90.7 should be modified to define LMS to include the following underlined terms: "The use of non-voice signalling methods from and to radio units to communicate with and make known the location and/or status of such units."

2. The first sentence of proposed Section 90.101 should be amended to include the following underlined terms: "The Radiolocation Service accommodates the use of radio methods for communication and determination of status, direction, distance, speed or position for purposes other than navigation."

3. The second sentence of proposed Section 90.105 should be amended to include the following underlined terms: "LMS systems utilize nonvoice radio techniques to communicate with and to determine the location and status of radio units."

C. The Expanded Services Proposed By the Commission Can Be Offered Over Available Spectrum Without Creating Spectrum Congestion.

The Commission has expressed concern regarding congestion in the available LMS spectrum.¹¹ SBMS recognizes that the expansion of the potential uses of the band raises a legitimate concern regarding spectrum congestion. SBMS believes that, with the appropriate changes to the LMS allocation discussed below (including re-location of narrow band systems to separate spectrum and the location of wide band forward links preferably outside the boundaries of the wide band spectrum or within a proposed exclusive 4 MHz assignment for each licensee), additional LMS services can be offered over the available spectrum without creating undue congestion or adversely affecting Federal Government and ISM licensees. In fact, existing technology will enable LMS systems to significantly increase LMS system capacity without increasing spectrum congestion. For example, the LMS system that SBMS intends to deploy in Chicago is based on a technology which can, within 2 MHz of spectrum, provide an initial capacity for up to 60,000 location messages per hour. It is contemplated that within that same 2 MHz of spectrum, capacity can be increased to 120,000

¹¹ NPRM at para. 9.

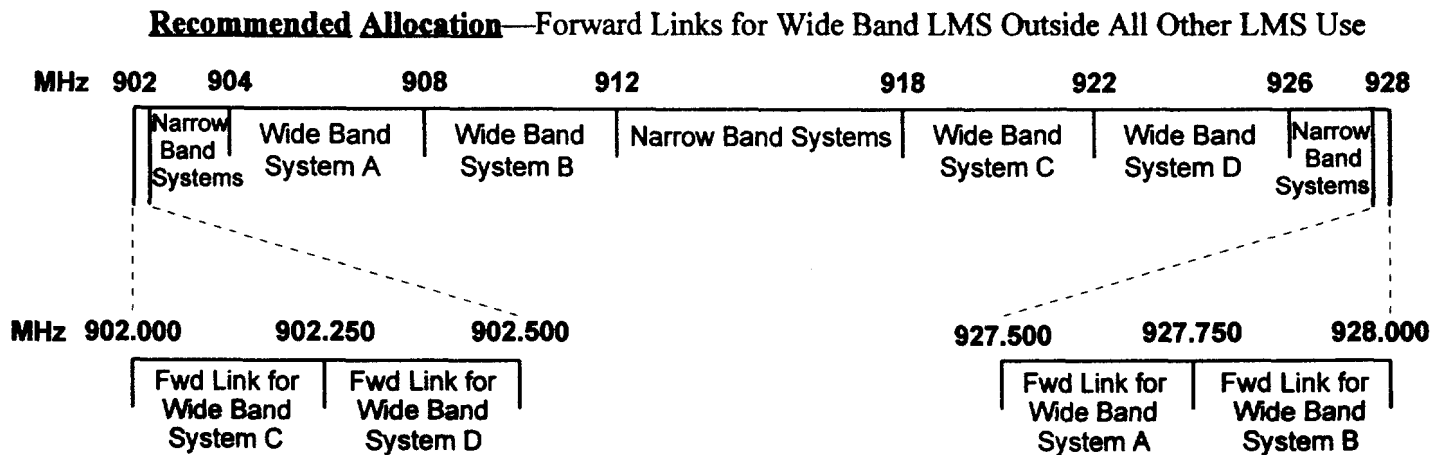
locations per hour.¹² While SBMS can offer significant services
over 2 MHz, as shown herein, an initial exclusive 4 MHz assionment

a developmental basis to narrow band LMS systems.¹⁵ The Commission has proposed to license LMS systems in the entire 902-928 MHz band, thus making new use of the 902-903, 912-918 and 927-928 MHz bands.¹⁶ The use of the additional eight MHz will give the Commission flexibility to allocate the LMS spectrum in a more efficient manner. Toward that end, the NPRM proposes that all narrow band licensees will be allocated to the 902-904, 912-918 and 926-928 MHz bands and that all wideband systems (systems of at least 2 MHz bandwidth) will be licensed in the 904-912 and 918-926 MHz bands.

The FCC's proposed allocation scheme raises a number of issues



A diagram of SBMS' preferred allocation proposal is set forth below:



This preferred allocation scheme separates narrow band and wide band licensees, as proposed by the Commission, and also places the forward links for wide band systems in separate spectrum to minimize interference to location and status messages. The allocation provides frequency separation between the forward and return links and it protects the forward link from other LMS signals.

Attached as Exhibit A is an alternative next-best allocation

same 4 MHz allocation set aside for its location spectrum. Since each wide band operator would operate its own forward links within its allocated 4 MHz band, it would have control over the forward link and be able to solve any interference caused by the link. Both the preferred and next-best proposals are discussed in greater detail below.

SBMS' proposed allocation scheme incorporates a number of the proposals presented by the Commission, including the separation of narrow band and wide band systems, and features the assignment of forward links to different channels outside of the wide band location spectrum.

B. Narrow Band and Wide Band Operators Should Be Allocated Separate Spectrum.

The Commission proposes to license narrow band systems on frequencies separate from those used by wide band LMS systems.¹⁸ The Commission correctly notes that there are now a number of licenses that have been granted on a non-exclusive basis in the 904 to 912 MHz and 918 to 926 MHz bands for both wide and narrow band operations without consideration of the compatibility of co-channel systems, their methods of operation or their operating bandwidth.¹⁹

As justification for the separation of wide band and narrow band systems the Commission points out that wide-band pulse ranging systems experience significant interference in the form of co-channel noise from narrow band systems. The Commission asserts

¹⁸ NPRM at para. 11 through para. 14 inclusive.

¹⁹ NPRM at para. 10.

that such noise makes it difficult, if not impossible, for a wide band system to operate effectively, and, although there are ways to overcome some co-channel noise, those solutions are generally not reasonable or cost effective.²⁰ SBMS acknowledges these difficulties, particularly as expanded services such as those proposed are implemented. While SBMS' technology can operate on 2 MHz in today's LMS environment, the changes proposed herein will insure SBMS can do so in the future as well.

SBMS believes the three-year relocation period for narrow band licensees is a fair one in that it gives those licensees the time necessary to relocate without significant service disruptions.²¹

C. The Commission Should Authorize at Least Four Exclusive Wide Band LMS Licensees.

The original Teletrac Petition for Rulemaking recognized that, at some point, too many users of a particular band will render the band useless.²² It must be anticipated that in a shared environment, even the most robust system can ultimately be overwhelmed by co-channel noise.²³ With the speculative interest

²⁰ NPRM at paras. 13-14.

²¹ Alternatively, if the Commission determines narrow band systems must share the LMS bands with wide band systems, it would be preferable that they be restricted to specific frequencies and that those frequencies be located at the band edges. This compromise would allow the maximum clear channel space to the wide band systems and would provide the narrow band systems with the maximum clear channels for their technology.

²² See Petition For Rulemaking filed by North American Teletrac and Location Technologies (hereinafter "Teletrac Petition") on May 28, 1992.

²³ Teletrac refers to this concept as the "Tragedy of the Commons." See Teletrac Petition at para. 35.

that will be created by this proceeding, the potential exists for frequency chaos in large urban markets if some controls are not placed on spectrum allocations. It is for these reasons that some measure of channel exclusivity must be introduced into the LMS band. SBMS proposes four initial 4 MHz wide band allocations in each market area on the 904-908 (Wide Band A), 908-912 (Wide Band B), 918-922 (Wide Band C) and 922-926 MHz (Wide Band D) bands.²⁴ Four megahertz is an equitable allocation because it will be least disruptive to existing operators whose systems appear to require greater bandwidth,²⁵ while affording more efficient operators room for growth on a non-interfering basis. By providing for up to four wide band LMS operators, the Commission will increase competition and encourage technological innovation, while providing a measure of stability to this fledgling industry.²⁶

SBMS strongly objects to retention of the present allocation patterns of two 8 MHz wide frequency allotments, resulting in no

²⁴ This idea was previously raised by SBC Comments at 3.

²⁵ In LMS applications filed with the Commission, Teletrac and another existing LMS licensee, MobileVision, suggest that 4 MHz is a possible operational bandwidth for their systems. In respective applications they list potential LMS chip rates of 1, 2 and 4 MHz which will result in null-to-null bandwidths of 2, 4 or 8 MHz. Limited studies conducted by SBMS on Teletrac system equipment appear to confirm that potential. It appears that in the final stages of its transponder transmitter, Teletrac uses a bypass filter with a resulting passband of about 3.5 to 4.0 MHz.

²⁶ New radio services often need room and time to mature before the Commission imposes further overlays of competition. This proposed allocation will serve that goal. See e.g., Amendment of the Commission's Rules To Provide Ancillary Services in the 849-851 and 894-896 MHz Bands, FCC-93-245, (June 4, 1993), in which the Commission recognized that the new 800 MHz Air-Ground Radio Telephone Service needs time to stabilize.

more than two LMS licensees (each granted an 8 MHz frequency assignment) in different cities across the country. Such a scheme is not in the best interest of the public.

The Commission recognizes that existing LMS providers are

D. Wide Band Forward Link Transmit Frequencies and Receive Frequencies Should Be Separated.

In the NPRM, the Commission recognizes the benefits which could accrue from the establishment of specific frequencies for forward link operations.²⁹ The Commission proposes specific forward link channelization for existing eight megahertz spectrum allocations. As part of its alternative allocation scheme SBMS suggests that forward links be assigned in 250 kilohertz segments to a separate 1 MHz of spectrum (from 902.0 to 902.5 MHz and from 927.5 to 928.0 MHz). Forward links generally use high power narrow band transmissions. It would be preferable to not have these transmissions "in band" along with the wide band low power LMS mobile-to-base transmissions because such an allocation can create harmful interference. The assignment of a particular spectrum for forward link operators would simplify the separation of signals from other operators' forward links and thus minimize interference. It would also allow for full utilization of the wide-band portions of the spectrum for LMS mobile-to-base operations.

~~It should be noted that the assignment of separate spectrum to~~

and moves the forward links into each 4 MHz wide band allocation where they can be controlled by wide band operators.

E. The Establishment Of A Five Year Waiting Period For Additional LMS Licensees In A Geographic Area Is Contrary To The Public Interest.

The Commission proposes two alternative approaches for licensing wide-band LMS systems.³⁰ The first would license wide band, pulse ranging systems on a non-exclusive basis in the 904 to 912 and 918 to 926 MHz bands, if spectrum sharing is immediately feasible.³¹ Although SBMS believes that sharing is feasible, it believes that long term management of the spectrum requires exclusivity. The Commission's second alternative would protect the first two wide band licensees in each market indefinitely and would prohibit any co-channel applications within a 110 mile radius of existing licensees for a period of five (5) years.³² SBMS vigorously opposes this set-aside alternative as contrary to the public interest because it does not allow full utilization of the LMS spectrum and rewards warehousing.

1. Since LMS Spectrum Has Been Licensed on a Non-Exclusive Basis, All LMS Providers Should Operate With Technologies That Can Function in a Multiple Provider Environment.

The Commission correctly points out that existing LMS licenses are issued on a non-exclusive basis, must operate on a secondary basis to Federal Government users and must accept interference from

³⁰ NPRM at para. 22.

³¹ Id.

³² Id.

basis to Federal Government users and must accept interference from industrial, scientific and medical ("ISM") devices.³³ Accordingly, each LMS provider which currently has a license should already have developed and be utilizing technologies which can operate efficiently within this shared environment. Should the Commission now decide to accord 8 MHz licensees exclusivity based on anecdotal claims of interference, the Commission would be rewarding inefficient technologies which are incapable of functioning within the existing environment.³⁴

SBMS made its technological choice after close examination of the constraints of the LMS band operating environment and the co-channel use provisions of the current rules governing the use of these bands. Quiktrak technology will allow for the deployment of a high capacity LMS service which can co-exist with government and ISM systems operating in the 902 to 928 MHz bands.

2. The Establishment of a Set-Aside for Existing Licensees for a Period of Five Years Could Effectively Limit, and In Some Cases Eliminate, LMS Service In A Large Number of Markets.

As the Commission is aware, Teletrac has obtained LMS licenses in scores of markets, but it is not clear in how many of those it is providing LMS service. As of May, 1993, the number was

³³ NPRM at n. 24, citing 47 C.F.R., 90.239(c)(ii). LMS operators must also share the spectrum with unlicensed devices under Part 15 and amateur radio operations under Part 97 who are allocated spectrum on a secondary basis to LMS operations.

³⁴ Teletrac has made several claims of interference from co-channel licensees, including extremely low powered transmitters utilized by toll tag scanning devices.

apparently only six.³⁵ In addition, another licensee, MobileVision, has obtained LMS licenses in over 100 markets to date. If the Commission adopts the five year protection plan for existing licensees, MobileVision and Teletrac would be the prime beneficiaries of this protection. At least in the case of MobileVision, the carrier's benefit might be the public's detriment.

MobileVision has not constructed a single commercial LMS system. Attached as Exhibit B is a letter, dated April 23, 1993 submitted on behalf of SBMS to the Private Radio Bureau, alerting the Commission to the recent discovery of litigation between the MobileVision partners and the assertions made by each partner regarding the likelihood of the construction of systems by MobileVision. As noted in Exhibit B, the various partners, including Ameritech MobileData, Inc. ("AMDI"), have at one time or another alleged that:

- a. No MobileVision LMS system has been constructed in Chicago, which was to be the first system constructed by MobileVision;
- b. MobileVision has abandoned efforts to construct an LMS system in Chicago, and the Ameritech entity

³⁵ As of May 21, 1993, Teletrac represented that it was operating systems in only six cities (Los Angeles, Chicago, Detroit, Dallas, Houston and Miami). See Affidavit of Cynthia S. Czermer, dated May 19, 1993 appended to "North American Teletrac and Location Technologies, Inc.'s Application for Freeze" (May 21, 1993).

providing funding for the partnership has terminated all funding nationwide;

- c. The existing MobileVision system design is flawed, and the development of a viable system design is more than a year from completion; and
- d. There are serious questions whether the MobileVision system in Chicago or more than 80 other markets will ever be developed.³⁶

Nearly two months after SBMS filed its letter with the Commission MobileVision filed a response asserting that it is only now beginning to build its first operational system in Chicago and is beginning to do so in Washington, D.C. Even now MobileVision gives no hint as to when it might begin construction in its other markets or complete construction in Chicago and Washington, D.C.³⁷ SBMS continues to question whether MobileVision has the capacity to construct 2 or 100 systems. AMDI was its sole source of funding. AMDI has now apparently withdrawn from the partnership. Neither MobileVision nor AMDI have given any information regarding alternative funding sources.

³⁶ See Exhibit B and references to various public filings made by the MobileVision partners cited therein.

³⁷ Of course, MobileVision (now apparently operated by METS, Inc.) is the same company which AMDI asserted in its Amended Complaint had deceived AMDI regarding its system's capabilities. Indeed, AMDI noted that as recently as the summer of 1992, MobileVision's then current system ". . . did not and would not work." See Amended Complaint, at p. 5, AMDI, et al. v. METS, Inc., et al., N.D. Ill., Case No. 93-CV-1261, Filed March 22, 1993.